Third Grade Mathematics

Standard 1: Students will acquire number sense and perform operations with whole numbers and simple fractions.

Objective 1: Represent whole numbers in a variety of ways.
   a. Model, read, and write *whole numbers* up to 10,000 using base ten models, pictures, and symbols.
   b. Write a *numeral* when given the number of thousands, hundreds, tens, and ones.
   c. Write a number up to 9,999 in expanded form (e.g., 6,539 is 6 thousands, 5 hundreds, 3 tens, 9 ones or 6000+500+30+9).
   d. Identify the place and the value of a given digit in a four-digit numeral.
   e. Demonstrate multiple ways to represent numbers using models and symbolic representations (e.g., fifty is the same as two groups of 25, the number of pennies in five dimes, or 75-25).

Objective 2: Identify relationships among whole numbers.
   a. Use a variety of strategies to determine whether a number is even or odd.
   b. Identify the number that is ten more, ten less, 100 more, or 100 less than any *whole number* up to 1,000.
   c. Compare the relative size of numbers (e.g., 31 is large compared to 4, about half as big as 60, close to 27).
   d. Compare whole numbers up to four digits using the symbols <, >, and =.
   e. Order and compare whole numbers on a number line.

Objective 3: Model and illustrate meanings of the operations of addition, subtraction, multiplication, and division and describe how they relate.
   a. Model addition and subtraction of two- and three-digit *whole numbers* in a variety of ways (e.g., *expanded form*, *compensation*, partial sums, regrouping).
   b. Model multiplication of a one-digit *factor* by a one-digit factor using various methods (e.g., repeated addition, rectangular *arrays*, *breaking apart,* manipulatives, pictures) and connect the representation to an *algorithm.*
   c. Model division as sharing equally and as repeated subtraction using various methods (e.g., rectangular arrays, manipulatives, number lines, pictorial representations).
   d. Demonstrate, using objects, that multiplication and division are *inverse operations* (e.g., 3x4=12; thus, 12÷4=3 and 12÷3=4).
   e. Select and write an addition, subtraction, or multiplication sentence to solve a problem related to the students' environment, and write a story problem that relates to a given equation.
   f. Demonstrate the effect of place value when multiplying whole numbers by 10.

Objective 4: Use fractions to communicate parts of the whole.
    a. Identify the *denominator* of a fraction as the number of equal parts in the whole region or set.
    b. Identify the *numerator* of a fraction as the number of equal parts being considered.
    c. Divide *regions* and *sets of objects* into equal parts using a variety of objects, models, and illustrations.
    d. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, sixths, and eighths.
    e. Determine which of two fractions is greater using models or illustrations.

Objective 5: Solve whole number problems using addition, subtraction, multiplication, and division in vertical and horizontal notation.
    a. Use a variety of methods and tools to facilitate computation (e.g., estimation, mental math strategies, paper and pencil, calculator).
    b. Find the sum of any two *addends* with three or fewer digits, including monetary amounts, and describe the process used.
    c. Find the *difference* of two-digit *whole numbers* and describe the process used.
    d. Find the *products* for multiplication facts through ten times ten and describe the process used.

Standard 2: Students will use patterns and relations to represent mathematical situations.

Objective 1: Recognize and create patterns with given attributes.
    a. Create and extend *repeating* and *growing patterns* using objects, numbers, and tables.
    b. Record results of patterns created using manipulatives, pictures, and numeric representations and describe how they are extended.

Objective 2: Recognize and represent mathematical situations using patterns and symbols.
    a. Recognize that symbols such as $\sim$, $\triangle$, or $\diamond$ in an addition, subtraction, or multiplication equation, represent a value that will make the statement true (e.g., $5+7=\triangle$, $\sim-3=6$, $\diamond=2\times4$).
    b. Solve equations involving equivalent expressions (e.g., $6+4 = \sim+7$).
    c. Use the $>$, $<$, and $=$ symbols to compare two *expressions* involving addition and subtraction (e.g., $4+6 \sim 3+2$; $3+5 \diamond 16-9$).
    d. Demonstrate that grouping three or more *addends* does not change the *sum* (e.g., $3+(2+7)=12$, $(7+3)+2=12$) and changing the order of *factors* does not change the *product* (e.g., $3\times7=21$, $7\times3=21$).
    e. Use a variety of manipulatives to model the *identity property of addition* (e.g., $3+0=3$), the *identity property of multiplication* (e.g., $7\times1=7$), and the *zero property of multiplication* (e.g., $6\times0=0$).

Standard 3: Students will use spatial reasoning to describe, identify, and create geometric shapes.

Objective 1: Describe, identify, and create geometric shapes.
    a. Identify and draw *points, lines, line segments,* and *endpoints.*
    b. Identify and draw *lines of symmetry* on triangles, squares, circles, and rectangles.

c. Determine whether an angle is *right*, *obtuse*, or *acute* by comparing the angle to the corner of a rectangle.
d. Classify *polygons* (e.g., *quadrilaterals*, pentagons, hexagons, octagons) by the number of sides and corners.
e. Identify, make, and describe cubes (e.g., a cube has six square *faces*, eight *vertices*, and twelve *edges*).

Objective 2: Describe spatial relationships.
   a. Give directions to reach a location.
   b. Use coordinates (A, 1) or regions (A-1) to locate positions on a map.
   c. Demonstrate and use horizontal and vertical lines.

Objective 3: Visualize and identify geometric shapes after applying transformations.
   a. Demonstrate the effect of a *slide* (*translation*) or *flip* (*reflection*) on a figure, using manipulatives.
   b. Determine whether two polygons are *congruent* by sliding, flipping, or turning to physically fit one object on top of the other.
   c. Identify *two-dimensional* shapes (*nets*) that will fold to make a cube.
   d. Create a *polygon* that results from combining other polygons.

Standard 4: Students will understand and use measurement tools and techniques.

Objective 1: Identify and describe measurable attributes of objects and units of measurement.
   a. Recognize the two systems of measurement: *metric* and *customary*.
   b. Describe the relative size (e.g., bigger than, smaller than) between metric units of length (i.e., centimeter, meter).
   c. Describe the relative size (e.g., bigger than, smaller than) among customary units of length (i.e., inch, foot, yard) and between customary units of *capacity* (i.e., cup, quart).
   d. Estimate length, capacity, and weight using metric and customary units.

Objective 2: Use appropriate techniques and tools to determine measurements.
   a. Measure the length of objects to the nearest centimeter, meter, half-inch, foot, and yard.
   b. Measure *capacity* using cups and quarts, and measure weight using pounds.
   c. Determine the value of a combination of coins and bills that total $5.00 or less and write the monetary amounts using the dollar sign and decimal notation.
   d. Identify the number of hours in a day, the number of days in a year, and the number of weeks in a year.
   e. Read, tell, and write time to the quarter-hour.
   f. Identify any given day of the month (e.g., the third Wednesday of the month is the 18th).
   g. Read and record the temperature to the nearest ten degrees using a Fahrenheit thermometer.
   h. Estimate and measure the *perimeter* and *area* of rectangles by measuring with nonstandard units.

Standard 5: Students will collect and organize data to make predictions and identify basic concepts of probability.

Objective 1: Collect, organize, and display data to make predictions.
    a. Collect, read, represent, and interpret data using tables, graphs, and charts, including keys (e.g., pictographs, bar graphs).
    b. Make predictions based on a data display.

Objective 2: Identify basic concepts of probability.
    a. Describe the results of events using the terms "certain," "equally likely," and "impossible."
    b. Predict outcomes of simple activities (e.g., a bag contains three red marbles and five blue marbles. If one marble is selected, is it more likely to be red or blue?).